

Date: Sat, 29 Oct 94 04:30:18 PDT  
From: Ham-Ant Mailing List and Newsgroup <ham-ant@ucsd.edu>  
Errors-To: Ham-Ant-Errors@UCSD.Edu  
Reply-To: Ham-Ant@UCSD.Edu  
Precedence: List  
Subject: Ham-Ant Digest V94 #359  
To: Ham-Ant

Ham-Ant Digest                      Sat, 29 Oct 94                      Volume 94 : Issue    359

Today's Topics:

### Advice needed for loss in BNC<->SO-239 connector  
    ### Whats a Balun? How do I make one?  
        50 Ohms Why ? (2 msgs)  
    BNC vs N vs UHF at VHF/UHF frequencies  
        Gamma-Match  
        How's the Wire ... Man?  
    How to build a cheap 2m/70cm antenna for the car ???  
    Is Bio-Logic still in business?  
    Needed: J-pole measurements  
        Phased array antennas  
        Source of ferrite cores  
    What's a good antenna for a Dorm Room?

Send Replies or notes for publication to: <Ham-Ant@UCSD.Edu>  
Send subscription requests to: <Ham-Ant-REQUEST@UCSD.Edu>  
Problems you can't solve otherwise to brian@ucsd.edu.

Archives of past issues of the Ham-Ant Digest are available  
(by FTP only) from UCSD.Edu in directory "mailarchives/ham-ant".

We trust that readers are intelligent enough to realize that all text  
herein consists of personal comments and does not represent the official  
policies or positions of any party. Your mileage may vary. So there.  
-----

Date: Fri, 28 Oct 1994 07:23:51 GMT  
From: wa2ise@netcom.com (Robert Casey)  
Subject: ### Advice needed for loss in BNC<->SO-239 connector

In article <3864u4\$6ae@nova.np.ac.sg> s2202629@np.ac.sg (Teh Aik Wen) writes:  
>Anyway, I've been trying to make this antenna featured in Sept'94 CQ.  
>(Anyone else doing it/has done it, care to email me?). I didn't read it  
>carefully enough, and bought a BNC connector instead of a SO-239 for the  
>antenna. Not difficult I thought, just go look for a 'single-hole,  
>rear-mount SO-239 socket'. But I didn't seem very successful in finding it.  
>

>What I did find however was a connector that was a BNC to SO-239.  
>  
>I was wondering, how much 'losses' would I face if I went ahead and used the  
>BNC, followed by this connector? Reason why I want to do this is because I'm  
>having difficulty in finding the SO-239 (single hole, rear mount).  
>  
>Just a note, the 'other side' of the SO-239 socket was supposed to be a  
>length of RG-58/U that is some 2" and then connected directly to the twin  
>lead (that makes up the antenna).  
>  
I would just use the BNC connectors on the antenna and that 2" of RG58  
and forget about the UHF connectors. I would guess that your antenna  
may be for VHF, but if it's that or HF, you should be able to safely  
use the BNC's only. BNC's are better than "UHF"'s anyway, BNC's are  
good up to a few GHz, UHF to around 200MHz? Some years ago, someone  
did a test of UHF connectors vs frequency, and, while not great, you  
can get away with a pair on VHF (one at xmitter, other at antenna).  
Any extra (switchboxes, etc) and things get yucky.

You'll get more error or "slop" building antennas (length, thickness of  
elements, angles and spacing, nearby objects, etc that will degrade  
things more than the BNC or UHF choice would make.

-----  
Date: 27 Oct 1994 04:35:05 GMT  
From: s2202629@np.ac.sg (Teh Aik Wen)  
Subject: ### What's a Balun? How do I make one?

This is a 100% newbie question. I know.  
So far, all I understand is a balun is something to 'convert' (?) a balanced  
feed (eg coax) to a unbalanced feed (eg twin lead).

Could someone explain (in \_simple\_ terms) what is a balun, and how does it  
work?

Also, how can I make one? I'm interested in a 50ohm-300ohm balun. I opened  
one up that came with my TV antenna, it was a 75ohm-300ohm balun, and it  
looked like a few small strands of wires twisted around a little black  
ring...

I mean, seriously, in simple terms, how does it work, and how do I  
calculate the no of turns I will need... Does the size of that black thing  
matter? (I think it's a ferrite 'something'... Is that the same as a  
magnet?) What about the size/type of wires to use?

Would appreciate enlightenment.

-----  
Date: Fri, 28 Oct 1994 14:37:58 GMT  
From: mack@ncifcrf.gov (Joe Mack)  
Subject: 50 Ohms Why ?

In article <6809.9410281220@csu.napier.ac.uk> ee17@csu.napier.ac.uk (Alastair "J." Downs) writes:

>This has probably been asked before (but at least it may have been clarified)  
>  
>Why choose 50 ohms as the stanard characteristic impedance for RF kit ?

It's a compromise. The minimum attenuation occurs at 70ohms (which is presumably why cable TV companies here use 70ohm cable), the maximum power handling is at (I think) 37ohms and so 50ohms is about in the middle.

Joe NA3T

>  
>regards,  
>  
>  
>%% Alastair J. Downs            \\_ \\_ \\_ \    Edinburgh, Festival City,        %%  
>%% a.downs@csu.napier.ac.uk    \ | \ \ \    Athens of the North, if you've %%  
>%% gm6nei@gb7edn.#77.gbr.eu    |            never been, you won't know        %%  
>%% gm6nei.ampr.org[44.131.13.51]/| \        what you're missing.....%%  
>  
>

-----  
Date: 28 Oct 1994 13:06:51 -0700  
From: hale@btree.brooktree.com (Bob Hale)  
Subject: 50 Ohms Why ?

In article <CyE0nA.BB4@ncifcrf.gov>, Joe Mack <mack@ncifcrf.gov> wrote:  
>In article <6809.9410281220@csu.napier.ac.uk> ee17@csu.napier.ac.uk (Alastair "J." Downs) writes:

>>Why choose 50 ohms as the stanard characteristic impedance for RF kit ?  
>  
>It's a compromise. The minimum attenuation occurs at 70ohms (which is  
>presumably why cable TV companies here use 70ohm cable), the maximum  
>power handling is at (I think) 37ohms and so 50ohms is about in the  
>middle.

Correct. But the coax which produces these results is air-dielectric copper coax, not the plastic insulated stuff that most of us use. If

you try to find the minimum loss or maximum power handling impedances for plastic insulated coax you will find that you need to know the operating frequency because the dielectric's behavior changes so much with frequency.

More than anything else, the reason why coax is so commonly found in 50 and 75 ohm impedances is economic; people aren't going to replace their test gear every time that some new optimum impedance rears it head.

Bob Hale    hale@brooktree.com

-----  
Date: 28 Oct 1994 16:48:49 GMT  
From: depolo@blue.seas.upenn.edu (Jeff DePolo)  
Subject: BNC vs N vs UHF at VHF/UHF frequencies

There was recently some discussion about using adapters, different connectors, etc. on VHF and UHF. I did some experimentation a while back. Although the test methods could have been improved, at least the results give some idea as to what to expect. I won't go into full detail about how I did the experiment, but in general, I made up halfwave patch cables using high quality cable with known loss figures, all of which had an N connector on one end of the cable, and the other end terminated with an Amphenol crimp BNC connector, a Kings clamp right-angle silver BNC, an Amphenol crimp N connector, a Kings silver clamp-style N, an Amphenol phenolic PL-259 (with reducer of course), an Amphenol phenolic silver-plated PL-259 with silver reducer, and a K+I silver-plated teflon PL-259 with silver reducer. Basically I took one of everything I had, all of which were new connectors, to make a total of 7 patch cables. Oh yeah, the cable I used was Times Microwave RG-400. The test setup was basically this:

[Transmitter] -> [3dB pad] -> [Bird #1] -> test cable -> [Bird #2] -> [Load]

The patch cables between the 3dB pad and Bird #1 and between Bird #2 and the dummy load were cut to be half-wave electrical lengths of RG-400 with N connectors. So basically, by swapping out the test cable, and by putting the appropriate mating connector on the right side of Bird #1, I could see what effect the different connectors had as far as loss (by comparing watt meter readings between Bird #1 and Bird #2) and SWR (by calculating SWR based on Bird #1's readings). I used the N to N patch cable as the reference cable, and normalized my loss values to this value to compensate for a) loss in the test cable itself, and b) small differences in meter readings between the two Birds.

All of the tests were done on the 440 MHz band. Test equipment included a typical ham rig as a transmitter, 2 Bird 43P directional wattmeters with 1, 10 and 50 watt UHF slugs, a 3 dB Bird in-line pad with N connectors, and a 1 kW UHF dummy load with N connector rated for 1:1 SWR to 900 MHz (Electro Impulse).

I found that the patch cables that used either N or BNC connectors, including the one BNC right-angle connector, had no measurable effect on loss or SWR at 440 MHz. This is in line with everything I've ever seen, read, or heard. Reflected power was unmeasurable with the 1 watt slug in the Birds with 18 watts forward shown on Bird #1.

The UHF connectors are another story. With the Amphenol phenolic UHF connector in place, SWR was calculated at 1.46:1, and the \*measured\* loss was approximately 0.3 dB. Note that the measured loss value doesn't match what the calculated loss should be (see the last paragraph as to why).

The Amphenol silver-plated phenolic connector yielded identical results to the regular Amphenol phenolic connector above.

The K+I silver/teflon connector showed a big improvement over the standard phenolic connectors. SWR was calculated at 1.16:1 and measured loss after corrections was under 0.1 dB.

I also experimented a bit with adding adapters to the subject cable. I only wrote down some of the results, but suffice it to say that the loss/SWR values varied all over the place as did the quality of the adapters. One of the no-name UHF to BNC adapters I had in my adapter box shot the SWR to 1.74:1. Generally speaking, the high-quality adapters, like Amphenol, Kings, etc. performed better than the no-name chrome-plated hamfest-special adapters I had laying around. I won't buy no-name adapters ever again. I talked to Joel, the guy that owns the RF Connection, and he said that some of the generic import adapters actually use a coiled spring conductor between the center pins. Teriffic. At least he tells you this when you go to buy them and he warns against using them on VHF/UHF.

So what did I learn from all of this? Well, nothing new really. It reaffirmed the age-old caveat to stay away from UHF connectors on VHF/UHF frequencies. But if you have to use them because the antenna/rig/whatever you have already has a UHF female connector on it, SPEND THE EXTRA MONEY AND BUY SILVER/TEFLON UHF CONNECTORS. The extra \$0.20 you spend per connector is definately worth it. I'd venture a guess that the silver plating on the body of the connector has negligible

effect on the RF performance of the connector, but it sure makes it a LOT easier to solder to. As far as adapters go, stay away from them if at all possible, but if you have to use them, make sure you get good quality adapters from a reputable manufacturer.

I would have to attribute the inconsistencies between calculated and measured losses to differences in the wattmeters, wattmeter directivity, and differences in the wattmeter slugs. Using directional wattmeters in this fashion always seems to involve a little black magic and some creative guesstimating/interpolation between the tick marks on the meter face. With the equipment I had, it was about the best I could do. Take it for what it's worth. The 3 dB pad between the Tx and the first Bird was inserted in attempt to dampen the effect of changing load impedance the the rig sees.

--- Jeff

--

-----  
Jeff DePollo WN3A Twisted Pair: H:(215) 337-7383 W:387-3059 x300  
depolo@eniac.seas.upenn.edu RF: 443.800+ 442.400+ 442.200+ MHz PL 3B  
Claim to Fame: I got the first speeding ticket on the information superhighway  
-----

Date: 28 Oct 1994 08:56:45 -0700  
From: zardoz@ornews.intel.com (Jim Garver)  
Subject: Gamma-Match

In article <roschews.7.001640A8@panix.com>,  
Rob Roschewsk <roschews@panix.com> wrote:  
>How does one determine what kind of capacitor should be used for a gamma feed  
>for a 1/2 wave antenna????

Get a copy of Yagimax which is available on many sites and BBS's.  
Besides the yagi antenna optimizer program the package contains a couple of nicely done programs to calculate both gamma matches and hairpin matches. I used the gamma match program a couple of times and my match was very close on the first try. I made the capacitor out of RG-213 coax innards that I shoved into some aluminum tubing of a tight enough dimension. I then checked the books for the capacity value of the coax per foot and applied the correct length. Works good. Just strip off the jacket and all the braid from the coax. I buy all the junk antennas I can get at swap meets. This has built me a great stock pile of aluminum tubing.  
If you want the calculations, my 1974 copy of the ARRL Antenna Book (\$5 then, \$30 today) has the complete gamma match description, formulas, Smith charts, etc. on page 119. Good Luck!

--

zardoz@ornews.intel.com WA7LDV "Each day is like a crisp new dollar bill.  
I speak only for myself. How will you spend it?" - Barnaby Jones

-----  
Date: 28 Oct 94 15:11:10 GMT  
From: dkelly@nebula.tbe.COM (david kelly)  
Subject: How's the Wire ... Man?

Glenn D. O'Donnell said:

> Hi everyone,  
> Our local club is looking to buy mass quantities of coax so our members can  
> take advantage of the bulk rate. We're looking at various varieties of cable  
> and we all feel warm & fuzzy about Belden.  
> One of our members got a copy of "The Wirebook" from "The Wireman". The  
> book is a fantastic collection of information about transmission lines and  
> such. It is also, of course, the catalog for "The Wireman". Their cable  
> looks almost too good to be true! Therein lies my skepticism.  
> Is their cable REALLY that good? Who makes it? I find it hard to believe  
> that they would make it themselves. The overhead for such an operation must  
> be huge.  
> Please respond via email since I usually don't get a chance to read the  
> newsgroups. I will summarize my findings on these newsgroups.

Wireman is a regular at most hamfests I attend in AL, GA, TN, and has developed a very loyal following. The other cable guy that was making the hamfest route gave up. August 20 at the Huntsville Hamfest I purchased 400' of CQ1000 (similar to 9913, longer life, no air dielectric), and 400' of their high quality RG213, and rotor cables. Needless to say, I feel warm and fuzzy about Wireman products.

The shipping tags on their coax reels indicate the coax came from Times Wire and Microwave. Or maybe its just Times Microwave. I have not doubt this is excellent merchandise. Not only that, but the Wireman seems to truly enjoy his business selling wire.

When you approach the Wireman to buy cable, first think he wants to know is what you want to do with it. Then he's just as likely to recommend something less expensive as something more expensive. I figured I'd buy 500' of the flexible "poor man's hardline" for my new Oscar station, and have extra laying around for other uses. He talked me out of it and into the less flexible solid core CQ1000, stating flexible was \$0.20 more per foot and that I would have to break the coax at the antenna for preamps anyway, so use flexible between the preamp and the antenna and save money.

73, David N4HHE

dkelly@nebula.tbe.com

-----  
Date: Fri, 28 Oct 1994 16:34:10 GMT  
From: wws465@as-nwfs-1.ku-eichstaett.de (Klaus Neudecker)  
Subject: How to build a cheap 2m/70cm antenna for the car ???

Hello!

In the middle of next month I hopefully start being a ham (a licenced one!).  
First I want to begin on 2m / 70 cm. And as I'm now running out of money,  
perhaps someone out there in internetspace can help me.

I want to build an antenna for a magnetic foot for the car roof for 2m &  
70cm. A singleband 2m antenna wouldn't be any problem I think. But what  
shall I do for a dualband antenna.

Hope someone out there understands my writing and can help me

73 de Klaus

Klaus.Neudecker@KU-Eichstaett.de

Klaus Neudecker  
Neubaustrasse 4  
85049 Ingolstadt  
Germany

-----  
Date: 28 Oct 1994 12:55:24 -0500  
From: acierno@csc.mc.edu (Mark J. Acierno)  
Subject: Is Bio-Logic still in business?

I bought a bio-loginc filter a few years ago and i've noticed that lately  
that parts are getting hard to come by. Does anyone know if they are still  
arround?

thanx

--  
Mark J. Acierno  
Mississippi College  
Clinton, MS 39058

inet: acierno@mc.edu  
(601)957-6783



-----  
Date: Wed, 26 Oct 1994 10:22:00 GMT  
From: clint.bradford@ectech.com (Clint Bradford)  
Subject: Needed: J-pole measurements

R>Path: planet!isdnlm.mtsu.edu!darwin.sura.net!spool.mu.edu!howland.reston.ans

### J - POLE ANTENNA

		DIMENSIONS					
		2 M E T E R S		220 MHZ			
		SECTION	AS SHOWN	CUT TUBING	AS SHOWN	CUT TUBING	
+	+	A	--	60 5/8"	60 1/4"	39 3/4"	39 3/8"
		B	--	20 1/4"	19 7/8"	13 1/4"	12 7/8"
		C	--	3"	2 1/4"	2"	1 1/4"

Cut 1/2" copper pipe to specifications and solder together as shown, (lower pole can be any length).  
Connect center conductor of coax to "B" side and ground conductor to "A" side both approx. 3 to 5 inches above the "T" & "L" connections (shorting bar). Tune using an SWR meter. ( Use stainless steel hose clamps to connect conductors to the J-Pole). I soldered the connections after tuning. My SWR reading is about 1.1:1, and works GREAT!

Good luck and most importantly Have Fun!

73s de -David #669-

Credits: I got this from N6ZAV (Marty)

+ = copper end cap      + = copper T connector      + = copper L (elbow) connector

---  
\* QMPro 1.53 \* CCITT- Can't Conceive Intelligent Thoughts Today

-----  
Date: 28 Oct 1994 10:13:56 -0400  
From: k8unp@bcfreenet.seflin.lib.fl.us (Peter Rimmel)  
Subject: Phased array antennas

Jeff Cauhape (cauhape@twg.com) wrote:

: Hi,

: Can anyone recommend an intro text on phased array  
: antenna design? Any help would be appreciated.

: Jeff Cauhape KB6TDU.

Get Low Band Dx-ing by ON4UN. It is the best!

--

Peter Rimmel

k8unp@bcfreenet.seflin.lib.fl.us

-----  
Date: Fri, 28 Oct 1994 15:41:48 GMT  
From: dcc@dcs.ed.ac.uk (David Crooke)  
Subject: Source of ferrite cores

My father (GM0RHP) is looking for a source of 4" long by 1/4" dia. ferrite core rods to build some fancy antenna. The only source he knows of is in California, USA - is there anywhere closer or am I best to just order them on plastic and have them pop them in the post in a jiffy bag?

Dave

--

David Crooke, Department of Computer Science, University of Edinburgh  
Janet dcc@ed.dcs : Internet dcc@dcs.ed.ac.uk : IP talk dcc@129.215.160.29  
Work: JCMB Rm 1408, King's Bldgs, W Mains Rd., Edinburgh EH9 3JZ. 0131 650 5164  
Home: 12 (GFR) West Savile Tr, Edinburgh, SCOTLAND EH9 3DZ. +44 131 667 4854

-----  
Date: 28 Oct 1994 14:15:50 GMT  
From: cmatthew@wpo.uwsuper.edu (CHARLES R. MATTHEW)  
Subject: What's a good antenna for a Dorm Room?

Charlie N0FXD here, Looking for suggestions of antennas types that would work good in a college dorm room (we like to call it a residence hall). I work on 2m FM/Packet and 10 SSB/CW. All replys welcome!

73's Charlie N0XFD

University of Wisconsin Superior  
"How Cold?" (Hoping for snow)  
E-Mail: cmatthew@wpo.uwsuper.edu

-----  
Date: Fri, 28 Oct 1994 09:11:51 -0400  
From: CSLE87@ucsd.edu (Karl Beckman)

References<itbkl.27.782544661@puknet.puk.ac.za> <Cy785B.16F@ncifcrf.gov>,  
<38jl1i\$b73@nntpd.lkg.dec.com>  
Subject: Re: ACURATE ROTATORS ???

In article <38jl1i\$b73@nntpd.lkg.dec.com>, little@iamu.chi.dec.com (Todd Little) wrote:

>  
> In article <Cy785B.16F@ncifcrf.gov>, mack@ncifcrf.gov (Joe Mack) writes:  
> |>In article <itbkl.27.782544661@puknet.puk.ac.za> itbkl@puknet.puk.ac.za (Keith Laaks) writes:  
> |>>I read somewhere that most of the 'commercial' rotators is not capable of  
> |>>rotating with an acceptable accuracy for EME. Apparently you need the  
> |>>rotator to be able to rotate to within 0.5 or 0.25 of a degree (in both  
> |>>planes).  
> |>  
> |>The theory is that drop off is about 1db /deg misalignement so to justify  
> |>that low noise front end which shaved off 0.1db, you should also point your  
> |>antennas with equivalent accuracy.  
>  
> How was the 1dB/deg determined? This seems counter-intuitive considering  
> the pattern of most antennas/arrays. The 4 antenna array the original poster  
> mentioned I would guess at having a half power beam width of at least 15-20  
> degrees and I would think then even a 5 degree pointing error would only  
> yield 1 dB of loss. The gain pattern of most antennas yield a main lobe with  
> a blunt end, i.e. gain starts to fall off much more quickly as you get to  
> the half power beamwidth. Much closer to the center of the main lobe though  
> has a fairly low rate of drop off.  
>  
> Does 3 degrees of pointing error really result in a 3 dB loss?  
>  
> 73,  
> Todd  
> N9MWB

It does when the target (moon) is only one degree wide. That is the problem that Keith was attempting to resolve (pun unintended, but appropriate). It doesn't matter that the beamwidth is several degrees if the object you are pointing at is significantly smaller. The (desired signal to solar/spatial noise) ratio will be significantly poorer if the antenna is aimed at the wrong point in the sky.

--

Karl Beckman, P.E. <The difference between stupidity and >  
Motorola Comm - Fixed Data <genius is that genius has its limits.>

Amateur radio WA8NVW @ K8MR.NEOH.USA.NA NavyMARS VBH @ NOGBN.NOASI  
The statements and opinions expressed here are not those of Motorola Inc.

-----

End of Ham-Ant Digest V94 #359  
\*\*\*\*\*